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# TOUCH PANEL SPECIFICATION

## MODEL NO.

## TP240128A

TOUCH PANEL FOR BG240128A

FOR MESSRS:

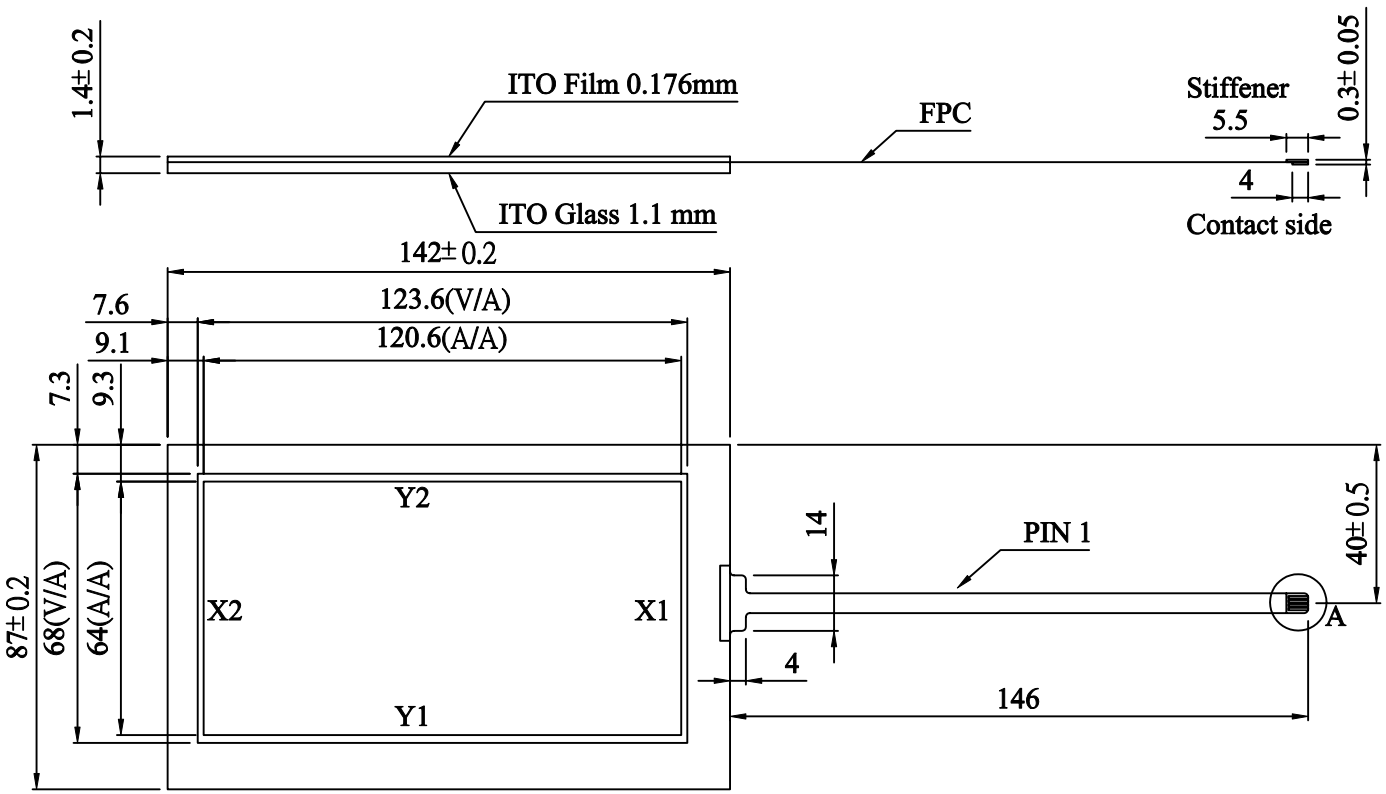
_____

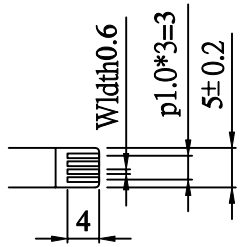
ON DATE OF:

_____

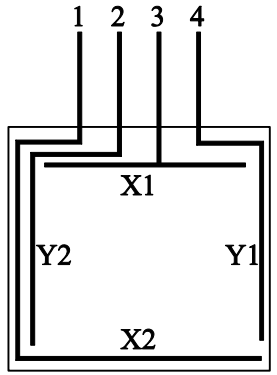
APPROVED BY:

_____




DETAL A
SCAL 2:1




NOTES:

1. Operation Temperature:-10°C~+60°C
   Storage Temperature :-20°C~+70°C
2. Life Time:>1,000,000 times
3. Linearity:<1.5%
4. PET: Clear Hand Coating And Anti-Newton Ring
   ITO Film Sheet Resistance 450±100Ω
   ITO Glass Sheet Resistance 500±100Ω
5. Light Transmission :>80%
6. Tall Type :FPC

| | | | |
|---|---|---|---|
| SCALE: 1/1 | REV: 0 | 寶麗明有限公司 BOLYMIN,INC. | |
| UNIT: mm | PAGE: 1/1 | | |
| APPROVE | | MODEL TP240128AAW0 | |
| CHECK | | TITLE Touch Panel DRAWING | |
| DRAW | Davidy 05/14/04 | DWG NO. | |

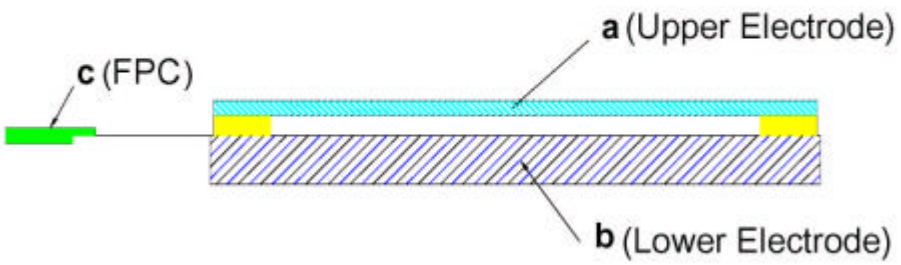
1. Product Type:
   Resistance Type
   Analog Type
   4-Wires Type
   Film on Glass

2. Criteria of Materials:

**(a) Upper Electrode:**
Type: Anti-Glare /Anti-Newton's Ring
Base material: ITO Film
Thickness: 188 ±10 um
Resistance : 500 ±100 Ω/sq

(b) **Lower Electrode:**
Base Material: ITO Glass
Thickness: 1.10 ±0.1 mm
Resistance: 500 ±100 Ω/sq

**(c) Criteria of FPC:**
Base Material: Polyimide Film
Tail thickness: 0.30 ±0.05 mm
Conduct layer: Copper
Insulation layer: Coverlet

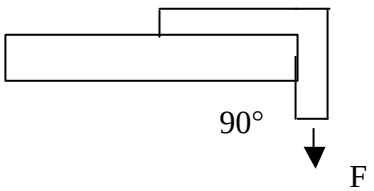



3. Definition:

3.1 **Active area:** Area to be guaranteed all characteristics stated on this specification.
3.2 **View area:** View area, which is inside adhesive zone or electrode pattern.
3.3 **Non-active area:** Area to protect miss-input when top enclosure edge touches the touch panel.

4. Characteristics:

4.1 Mechanical:

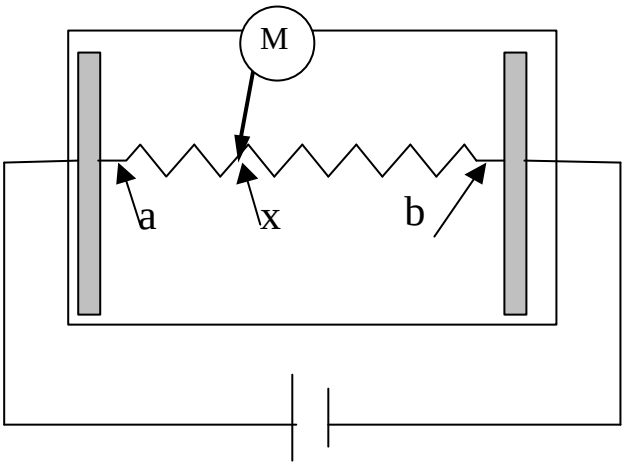
| Description | Specification | Remark |
|---|---|---|
| Outside Dimension | 87.00 mm x 142.00 mm | |
| View Area | 68.60 mm x 123.60 mm | |
| Active Area | 64.60 mm x 120.60 mm | |
| Product Thickness | 1.40 ±0.20 mm | |
| Input method | Finger or Pen | |
| Activation force | 20g ~ 100g | Test Condition:<br>End shape: R0.8mm<br>Resistance between X and Y axis must be equal or lower than 2KΩ, the test voltage=DC5V. |
| Hardness of surface | 3H | JIS K 5400 |
| FPC Peeling Force | Min150 g/cm | Peeling downward by 90°<br>  |
| FPC Bending Resistance | Meet electrical spec. after testing | Bending degree: 180°<br>Bending radius: R1.0 mm<br>Bending times: 10 times |

4.2 Electrical:

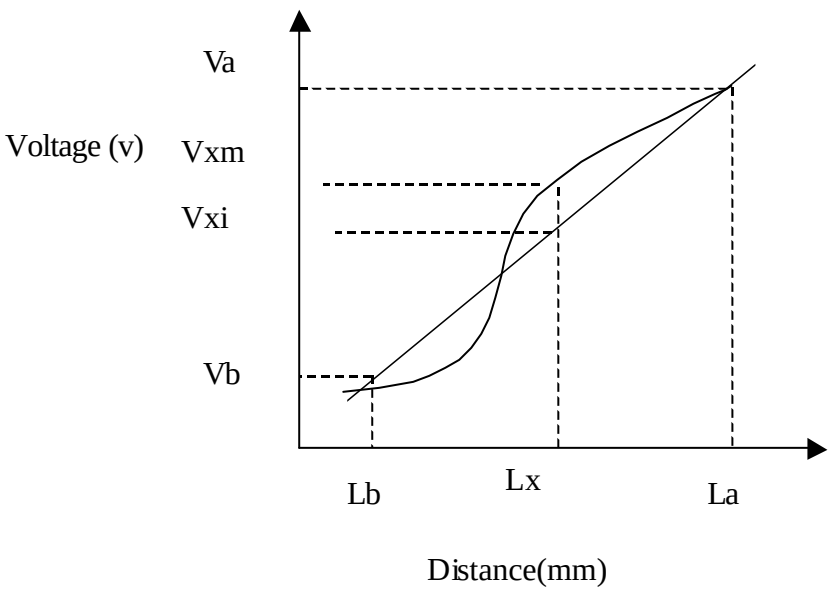
| Description | | Specification | Remark |
|---|---|---|---|
| Operating Voltage | | DC 5V | DC 7V Max. |
| Operating Current | | 20 mA Max | |
| Circuit Resistance | X- axis | 420 Ω ~ 1070 Ω | At connector |
| | Y- axis | 140 Ω ~ 460 Ω | At connector |
| Insulation Resistance | | ≧ 20MΩ | At DC 25 V, ≧ 60 sec. |
| Chatting | | ≦ 10 ms | Test Condition<br>Voltage: 3V and 6V<br>Frequency: 5Hz and 10Hz |
| Linearity | | ≦ ±1.5 % | Material of Pen : Poly-acetal resin<br>End shape: R0.8mm<br>Test Point : 100 Points<br>Test Force : 100 gf<br>Refer to Note 1 |

Note 1: Measurement condition of Linearity

Linearity Definition




Va : maximum voltage in the active area of touch panel
Vb: minimum voltage in the active area of touch panel
X : random measuring point
Vxm: Actual voltage of Lx point
Vxi : Theoretical voltage of Lx point




Linearity : [ | Vxi-Vxm | / (Va-Vb)]*100%

4.3. Optical:

| Description | Specification | Remark |
|---|---|---|
| Transmittance | > 80 % | ASTM D1003<br>Wavelength =550nm |

4.4 Processing Environment:

| Description | Specification | Remark |
|---|---|---|
| Operating Temperature | -5 ℃ ~ +60 ℃ | |
| Storage Temperature | -20 ℃ ~ +70 ℃ | |
| Operating Humidity | 20% ~ 90% RH | |
| Storage Humidity | 10% ~ 90% RH | |

4.5 Environmental test :

Under defined terms and condition test, product must be still satisfactory to electrical and mechanical characteristics.

| ITEM | Test Condition | Remark |
|---|---|---|
| High temp./High Humidity test | 60 °C @ 90%RH / 240hrs | Refer to Note 2 |
| Low temperature | -20°C / 240hrs | Refer to Note 2 |
| High Temperature | 70°C / 240hrs | Refer to Note 2 |
| Thermal shock test | -40°C / 0.5 hrs → 80°C / 0.5 hrs<br>Total 10 cycles | Refer to Note 2 |

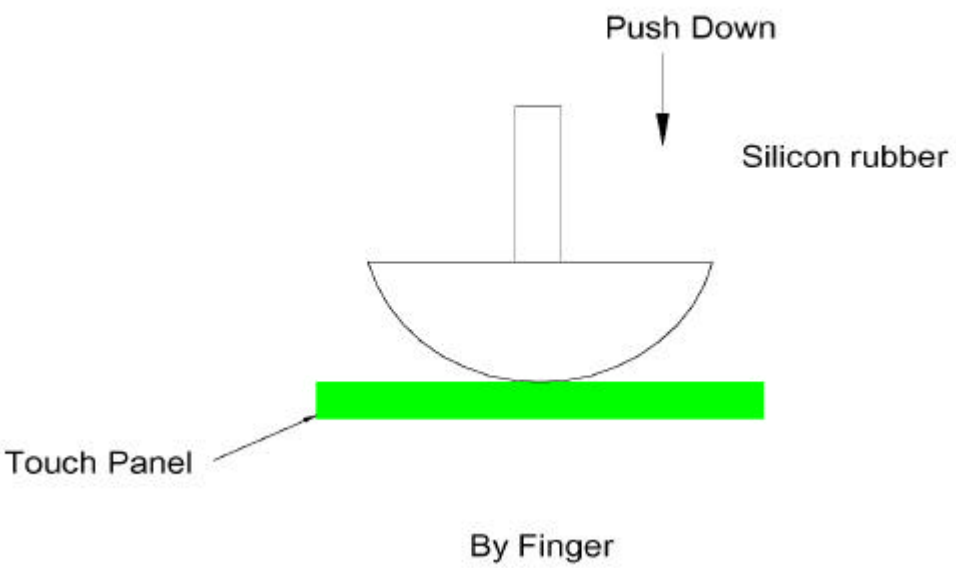
Note2. : To place in room temperature 24 hrs then test.

4.6 Durability test:

Under defined terms and condition test, product must be still satisfactory to electrical and mechanical characteristics.

| Description | Specification | Remark |
|---|---|---|
| Pen Writing Durability | ≧ 60,000 times | Test Condition:<br>End shape: R0.8mm<br>Load force: 250 gf<br>Writing speed: 300 mm/sec.<br>Material of Pen: Poly- acetal resin<br>Writing length: 35 mm |
| Finger knocking Durability | ≧ 1 Million times | End shape: R8mm, Hardness 50~60°<br>Load force: 250 gf<br>Frequency: 5 Hz<br>By Silicon rubber tapping at same points<br>Refer to Note 3 |

Note3: Test condition of Finger knocking Durability:
Resistance between X and Y axis must be equal or lower than 2KΩ



5. Inspection Criteria:

5.1 Foreign Object

| Location | Defect type | Criteria |
|---|---|---|
| View Area | a. D > 0.3mm<br>b. 0.3mm ≥ D > 0.2mm<br>c. 0.2mm ≥ D > 0.1mm<br>d. 0.1mm ≥ D | a. None<br>b. To be max. 3 points in 5mm ψ,but none of other defect in this area.<br>c. To be max. 5 points in 5mm ψ,but none of other defect in this area.<br>d. Don' t care |
| Printing Area | a. D ≤ 0.5mm | a. Don' t care |
| Remark | D= (Long ψ + Short ψ )/2 | |

5. 2 Scratch or line defect

| Description | | Defect type | Criteria |
|---|---|---|---|
| View Area | line defect | a. W > 0.05mm, L > 3mm<br>b. W ≤ 0.05mm, L ≤ 3mm | a. None<br>b. Don' t care |
| | Scratch | a. W ≥ 0.10mm, L ≥ 10mm<br>b. 0.10mm > W ≥ 0.05mm, L < 10mm<br>c. W < 0.05mm, L < 10mm | a. None<br>b. To be max. 4 points in 5mm ψ,but none of other defect in this area.<br>c. Don' t care |
| Printing Area | | Line defect can not across view area, silver area and insulation area. | |
| Remark | | W: Width ,L: Length | |

5. 3 Newton's ring

a. Inspection condition:

**I** .Tools→30W/Normal white light (office lamp)

b. Environments:

**I** .Illuminance:1000~1500 lx

**II** .black background

c. Method:

**I** .Avoid light to irradiate eyes.

**II** .Distance between eyes and panel is 30 ±10cm.

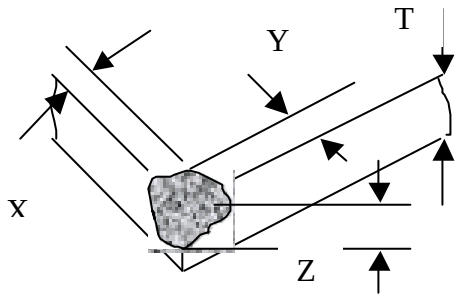
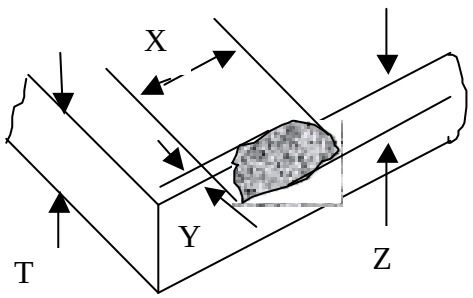
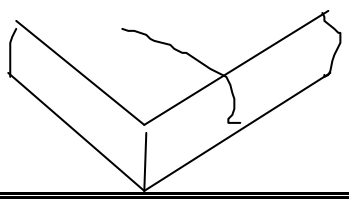
**III**.Check ITO film side.

**IV**.Begin to inspection at angle 60 ° , then turn left/right/up /down to inspect.

d. Criteria:

None of Newton' s ring

5.4 Glass flaw

| | | | | |
|---|---|---|---|---|
| | Corner flaw |  | X<=3.0mm<br>Y<=3.0mm<br>Z<=T | |
| | Edge flaw |  | X<=3.0mm<br>Y<=3.0mm<br>Z<=T | |
| | Progressive flaw |  | None allowed | |

6. Serial Number: **A** **B** **C** **D** **E**

1 2 005 002 001

A year example: 1→ 2002, 5→2006
B month example: 2→ February, A→October
C Production Order No. example: 005→ The Fifth production in February
D lot order example: 002→ Second Lot of Fifth Production Order.
E product serial No. example: 001→ First piece.

7. Part number: **A** **B** **C** **D** **E** **F**

1515 083 1 4 1 04

A product size example: 1515→ 15.15”

B variation code

C 1- Analog
2-Digital

D 4 is for 4-wire product
8 is for 8-wire product

E 1-Film to Glass
2-Film to Film
3-Film to Film to PC
4- Film to Film to Glass

F material code

8. Mounting T/P display to housing bezel

8.1 All kind of T/P should be propping up form the backside of the glass or hard film.

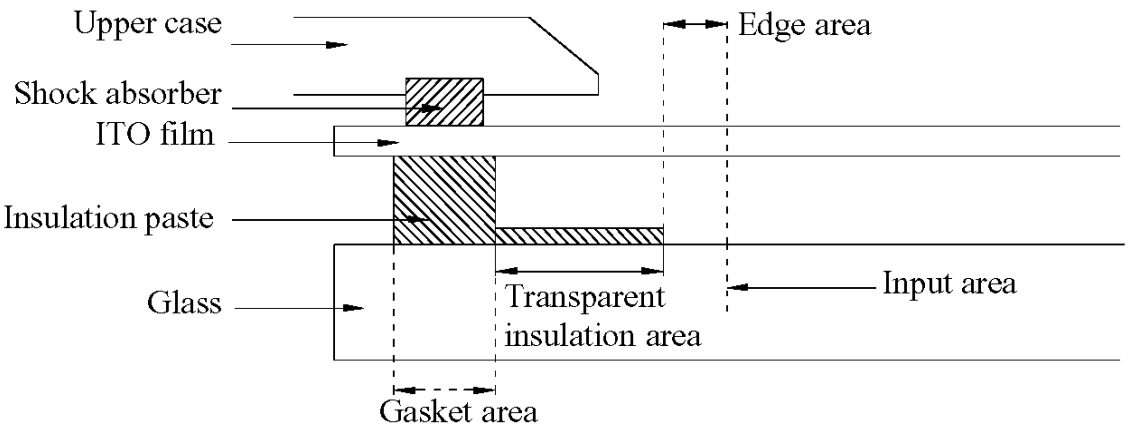
8.2 Do not use twin adhesive to fix through the front of the T/P or and hang it to the case bezel, because it would damage T/P.

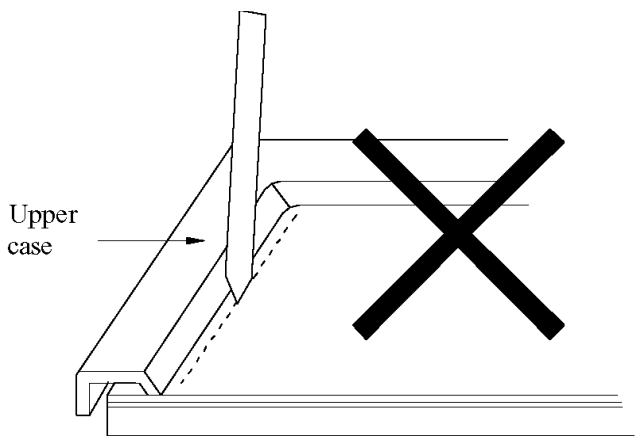
8.3 Do not press and expand the T/P top layer, as elastic material because it would cause the lifetime of the T/P will be extremely short.

8.4 Please consider the weather-tight seal if your final product will be used in harsh environmental conditions. Because the conductive area of the flexible tail to sock in water, the migration of the silver may occur.

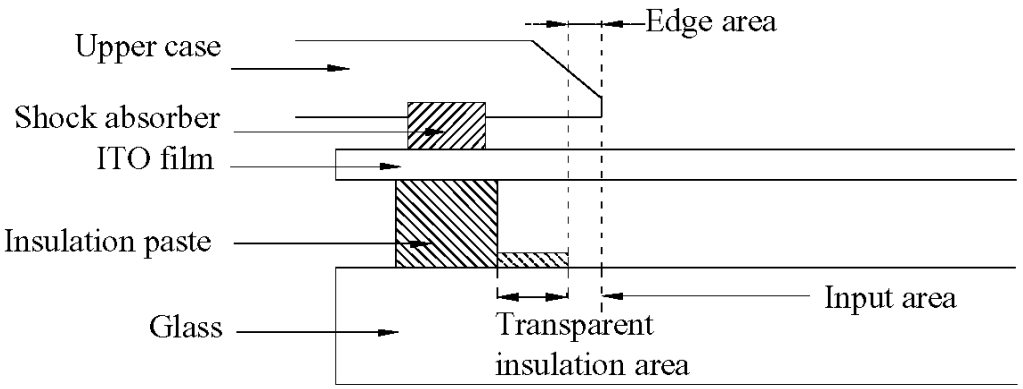
8.5 When mounting T/P to the housing bezel, the foam gasket should be limited to the T/P gasket area. If it is over the T/P edge area. A "false touch" may occur.

8.6 Edge area is the area just outside the "input area" and normally the width of 0.5 mm, edge area that durability with the pen sliding is one-tenth compared with the "input area" and the actuation force is nearly double. The value is the average of measurement, not a guaranteed one.



8.7 Recommend design-mounting method:




9. Safety and Attention:
   - 9.1 Since Touch panels consist of glass, please be careful to handle your hand and other part. You must wear gloves at handling.
   - 9.2 Don't put a heavy shock or stress on Touch panel
   - 9.3 Don't lift Touch panel by cable.
   - 9.4 Don't add any stress only film face.
   - 9.5 Please use dry cloth or soft cloth with neutral detergent or one with ethanol to clean surface. Forbid wiping the boundary between ITO glass and film.
   - 9.6 Don't use any organic solvent acid or alkali solution.
   - 9.7 Don't pile Touch panel. Don't put heavy goods on Touch panel.
   - 9.8 Don't bend a cable of Touch panel for prevent happen to line cut failure.
   - 9.9 Please don't use following method for insert the cable to connector.
   - 9.10 Please pay attention for the matter as stated below at mounting design of Touch panel and enclosure.
     - Enclosure support to fix Touch panel must be out of View area.
     - Enclosure edge must be between view area Guaranteed active area
     - We recommend the material of support to fix Touch panel is elastic material
     - Don't bond top of surface(film) of Touch panel w/ enclosure.
     - The corner parts have conductivity. Don't touch any metal part after mounting.

10. Guarantee:

The period of warranty, One year, E TOUCH will take charge to repair or replace the fault parts, if the fault cause by E TOUCH.

What is called guarantee object is delivery goods. E TOUCH don't guarantee if the delivery goods fault cause by customer production line's repair or replace

It's not guarantee as following:

10.1 The goods fault cause by the goods drop or strike after delivery or customer miss-operation.

10.2 The goods fault cause by nature disaster

10.3 The customer reworked the goods before E TOUCH approved it.

10.4 The customer doesn't follow the user's manual attention to operate the goods cause the goods fault.

11. Modify Resume:

| Version | Description | Date |
|---|---|---|
| 1.0 | Reference | 2002/09/19 |
| | | |
| | | |